

CLAIMS

We claim:

1. A multilayer container comprising:
 - a first layer defining an outermost layer of the container and comprising polypropylene; and
 - a second layer comprising a barrier material, directly bonded to said first layer;
 - at least one of said first and second layer further comprising an adhesive incorporated therein in an amount of up to approximately 0.20% by weight.
2. The container of claim 1 wherein said first layer comprises up to approximately 0.03% by weight of adhesive.
3. The container of claim 2 wherein the adhesive is maleic anhydride.
4. The container of claim 1 wherein said barrier material comprises EVOH.
5. The container of claim 1 wherein said container has a haze value of less than approximately 29% measured through a section of the container having a total thickness of greater than approximately 0.015 inch.
6. The container of claim 1 having a haze value of approximately 10%-12% measured through a section of the container having a total thickness of greater than approximately 0.015 inch.
7. A multilayer container comprising:
 - a first layer defining an innermost layer of the container and comprising polypropylene; and
 - a second layer comprising a barrier material, directly bonded to said first layer;
 - at least one of said first and second layer further comprising an adhesive incorporated therein in an amount of up to approximately 0.20% by weight.
8. The container of claim 7 wherein said first layer comprises up to approximately 0.03% by weight of adhesive.
9. The container of claim 8 wherein the adhesive is maleic anhydride.
10. The container of claim 7 wherein said barrier material comprises EVOH.
11. The container of claim 7 wherein said container has a haze value of less than approximately 29% measured through a section of the container having a total

thickness of greater than approximately 0.015 inch.

12. The container of claim 7 having a haze value of approximately 10%-12% measured through a section of the container having a total thickness of greater than approximately 0.015 inch.
13. A stretch blow molded multilayer container comprising:
 - a first layer having polypropylene; and
 - a second layer comprising a barrier material, directly bonded to the first layer, the container having a haze value of less than approximately 29% through a section of the container having a total wall thickness of at least 0.015 inch.
14. The container of claim 13, the haze value is less than approximately 12%.
15. The container of claim 13 being manufactured by reheat stretch blow molding.
16. The container of claim 13 further comprising a third layer having polypropylene, directly bonded to the second layer opposite the first layer.
17. The container of claim 13, the barrier material being EVOH.
18. The container of claim 13, at least one of the first and third layers further comprising an adhesive agent to facilitate the bonding of the first and third layers to the second layer.
19. A multilayer container comprising:
 - a first layer defining an innermost layer of the container and comprising a barrier material;
 - a second layer directly adjacent to the first layer and comprising polypropylene and an adhesive agent;
 - a third layer directly adjacent to the second layer and comprising a barrier material.
20. The container of claim 19, further comprising a fourth layer defining an outermost layer of the container and comprising polypropylene.
21. The container of claim 20, further comprising a discrete adhesive agent layer between the third layer and the fourth layer.
22. The container of claim 20, further comprising a regrind layer between the third and fourth layer.

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22.

The container of claim 19, the adhesive agent comprising a maleic anhydride.

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The container of claim ²³22, the maleic anhydride being present in the second layer in the amount of up to 0.03% by weight.

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24.

An injection molded preform for reheat stretch blow molding a container comprising polypropylene and having a finish, a neck extending from the finish, a sidewall extending from the neck and a base extending from the sidewall, the preform comprising a finish having a support flange, and a preform blow section having a neck extending from the support flange, a sidewall extending from the neck and a base closing the blow section, the preform sidewall having a thickness at least approximately 2.3 times the thickness of the container sidewall.

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The preform of claim ²⁵24, the preform sidewall having a thickness at least 2.5 times the thickness of the container sidewall.

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The preform of claim ²⁵24, the preform sidewall having a thickness at least 2.7 times the thickness of the container sidewall.

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27.

The preform of claim ²⁵24, the average thickness of the preform sidewall being at least 2.5 times the average thickness of the container sidewall.

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28.

The preform of claim ²⁵24, the preform sidewall thickness varying from 0.074-0.120 inch and the container sidewall thickness ranging from 0.025-0.032 inch.

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29.

The preform of claim ²⁵24, the average radial stretch ratio to produce the container being less than approximately 4.5:1.

31.

30.

The preform of claim ²⁵24, the average radial stretch ratio to produce the container being between approximately 1.5:1 and 4.5:1.

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31.

The preform of claim ²⁵24, the preform comprising at least 90% polypropylene.

33.

32.

An injection molded preform for stretch blow molding a container comprising polypropylene, the preform defining a longitudinal axis and comprising a finish having a support flange, and a preform blow section comprising a neck extending from the support flange, a sidewall extending from the neck and a base closing the blow section, the base having a portion of increased thickness defining a thickness greater than all other portions of the blow section, a lower end of the sidewall and the base are directed inward toward the preform longitudinal axis.

33³⁴

The preform of claim 32³³, the base portion thinning from the base portion of increased thickness to the preform longitudinal axis.

34³⁵

The preform of claim 32³³, the sidewall increasing in thickness from the neck to the base.

35³⁶

The preform of claim 32³³, comprising an intermediate barrier layer.

36³⁷

The preform of claim 32³³, the preform comprising at least 90% polypropylene.

36³⁸

An injection molded preform for stretch blow molding a container comprising polypropylene, and having a finish, a neck extending from the finish, a sidewall extending from the neck and a base extending from the sidewall, the preform comprising a finish having a support flange, and a preform blow section having a neck extending from the support flange, a sidewall extending from the neck and a base closing the blow section, the preform facilitating an average radial stretch ratio of less than approximately 4.5:1 to produce the container.

37³⁹

The preform of claim 36³⁷, the average radial stretch ratio to produce the container being between approximately 1.5:1 and 4.5:1.

38⁴⁰

The preform of claim 36³⁷, the preform comprising at least 90% polypropylene.

39⁴¹

The preform of claim 36³⁷, the axial stretch ratio to produce the container being less than approximately 1.6:1.

40⁴²

A method of reheating a preform for stretch blow molding the preform defining a longitudinal axis and comprising a finish and a preform blow section comprising a neck extending from the finish, a sidewall extending from the neck and a base closing the blow section, the base having a portion of increased thickness defining a thickness greater than all other portions of the blow section, the method of reheating comprising exposing the preform blow portion to a plurality of reheat bulbs to elevate the temperature of the preform blow portion, an outer skin of the preform base portion of increased thickness being exposed to heating rays by substantially by only one bulb.

41⁴³

The method of claim 40⁴², the heating rays being infrared heating rays.

42⁴⁴

The method of claim 40⁴², the preform comprising polypropylene.

43⁴⁵

The method of claim 42⁴⁴, the preform comprising at least 90% polypropylene.

44⁴⁶

A stretch blow molding stretchrod comprising an elongated rod and a tip fixed to the

end of the elongated rod, the tip defining a backside and an arcuate stretching surface for engaging a preform, the backside comprising a surface variation to increase the surface area of the tip backside.

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45. The stretchrod of claim ⁴⁶~~44~~, the surface variation comprising a hole defined by the tip backside.

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46. The stretchrod of claim ⁴⁶~~44~~, the surface variation comprising a groove defined by the tip backside.

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47. The stretchrod of claim ⁴⁶~~44~~, the surface variation comprising a fin extending from the tip backside.

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48. The stretchrod of claim ⁴⁶~~44~~, the tip being annular about a longitudinal axis.

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